Conference Paper

Determinants of Welfare for the Elderly Population in Indonesia

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Abstract.
The increasing number of elderly people in Indonesia can be both a challenge and an opportunity. The increase in the number of elderly people can reflect the success of the government in implementing various health programs for the elderly. However, this increase can also be a challenge if the welfare of the elderly is not considered properly. The welfare of the elderly can be marked by the decreasing number of poor people. This study aimed to analyze the poverty determinants of the elderly population based on welfare in Indonesia, as measured by levels of poverty, education, health, and labor force participation. The data used were secondary data from the Elderly Statistic Report and the Welfare Report. The panel data analysis method was used. It was found that the rate of education, health, and labor force participation both simultaneously and significantly affect the number of poor people. This shows that the variables of education, health, and work participation rate, as welfare indicators, can help explain the increase or decrease in the rate of poverty in the elderly population.

Keywords: welfare, poverty, elderly

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1. Inroduction

In 2024, Indonesia is predicted to receive a demographic bonus for the population. Data from the Central Statistics Agency (BPS) states that in 2024 Indonesia is predicted to have 20 percent or around 63.31 million elderly population groups. Not only BPS, but the UN also predicts that by 2050 Indonesia will have around 74 million elderly people and this could reach 25 percent [1].

Based on statistics on the elderly population of BPS, from 2015-2019, there was a significant increase in the elderly population. The elderly population in the age range of 60-69 years was increased by 58.59 percent. Furthermore, the elderly population with a range of 70-79 years also experienced an increase from year to year amounting

to 25.27 percent. Meanwhile, the elderly population with the age range of 80 and over has increased quite significantly to 7.7 percent.

The increasing number of elderly people can certainly be a challenge as well as an opportunity. According to the BPS report, the increase in the number of elderly people shows that the government has succeeded in implementing various health programs for the elderly. However, this increase can also be a challenge if the welfare of the elderly is not properly considered.
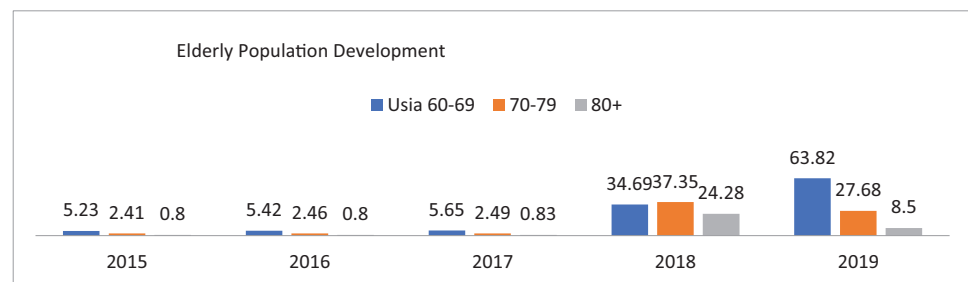
Figure 1: Elderly Population Development in Indonesia. Source: Statistics Report of the Central Bureau of Statistics.
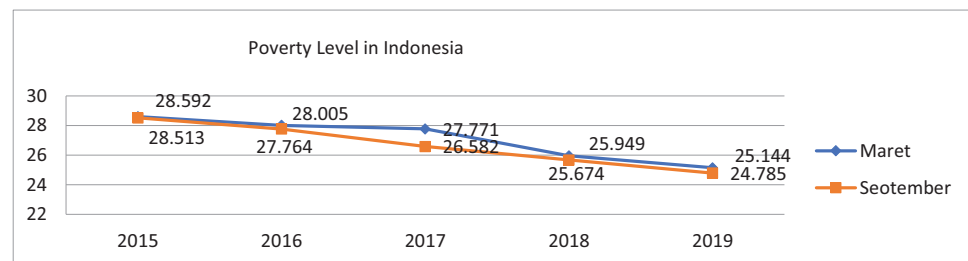
Figure 2: Poverty level in Indonesia. Source: Statistics Report of the Central Bureau of Statistics.

The impact of the COVID-19 outbreak is hitting all countries including Indonesia, certainly attacks people of all ages including the elderly who are the most vulnerable group to COVID-19. Based on WHO data, more than 95 percent of the death toll caused by the coronavirus affects people over 60 years of age. Meanwhile, more than 50 percent of all deaths occur in those aged more than 80 years or more. It can also be said that the death of the elderly is mostly caused by certain diseases such as hypertension, diabetes, etc [2].

The factors that cause the elderly to be susceptible to COVID-19 are because the elderly easily experience a decline in all body systems including immunity. Other than that, almost all of the elderly population have a history of diseases such as autoimmune, diabetes, heart disease, and high blood pressure that make the elderly more vulnerable to COVID-19 [3].

There are several important problems faced by the elderly during this pandemic. *First,* there are limitations and restrictions on activities that require doing all activities

at home. *Second,* reduced or no income to make ends meet. *Third,* reduced financial support from the family. *Fourth,* increasing social exclusion and isolation [4]. So it is important to pay attention to this aspect of the welfare of the elderly so that they do not affect and have an impact on several aspects of life such as social, economic, and environmental aspects [5].

Welfare is one of the important things for a country. Welfare can be defined as an order of life both from a social, material, and spiritual perspective that aims to meet physical, spiritual, and social needs for oneself, a household, or society [6]. Welfare can be divided into two subsystems, namely the social subsystem and the economic subsystem. Both systems have several factors including human welfare, social welfare, consumption levels, poverty, and economic activity [7].

The level of welfare shows whether the quality of a country's economic growth is good or not. This welfare can be indicated by the decreasing number of poor people [8]. BPS data shows the poverty rate for the last five years 2015-2019 has experienced a downward trend, both from the first semester (March) and the second semester (September). The existence of a decrease in the poverty rate is one indicator that shows that the welfare of the population in Indonesia, including the elderly, is getting better.

The increase in population, followed by the increasing number of elderly people in Indonesia has made the government have to focus more on the various problems faced by the elderly. The government must carry out various policies such as carrying out short and long-term programs. Short-term programs such as providing knowledge and understanding to the elderly about threats to health, economy, and security during the Covid-19 pandemic. Then in a long-term program such as immediately completing the revision of Law no. 13 of 1998 concerning Elderly Welfare, which in the revision aims to create productive and quality elderly people [3].

The programs short and long term are of course done to provide protection, assistance, and social security to improve the welfare of the elderly so that they do not become a burden to the family and the surrounding community. Therefore, based on the background described above, this study will analyze the welfare conditions of the elderly in Indonesia through various welfare indicators such as education, health, and labor participation levels. Later, the results of this study can provide information and analysis regarding the welfare of the elderly population in Indonesia using the panel data regression method.

2. LITERATURE REVIEW

2.1. Welfare

Welfare can be defined as a condition in which all people are in a prosperous, healthy, and peaceful state so that to achieve this state an effort is needed to achieve it [9]. Welfare can be defined as an order of life both from a social, material, and spiritual perspective that aims to meet physical, spiritual, and social needs for oneself, a household, or society [6]. Besides, economists argue that welfare is an indication of individual income and purchasing power. So it can be concluded that welfare can also be used as an indicator of economic prosperity because this welfare is seen as the opposite of poverty [9]. According to the Central Statistics Agency, there are eight indicators used to see the level of welfare, namely income, consumption and expenditure, housing conditions, housing facilities, the health of family members, ease of accessing health services, ease of enrolling children in education and ease of accessing transportation facilities.

2.2. Elderly Population

Based on Government Regulation of the Republic of Indonesia No. 43 of 2004, an elderly population is someone who reaches the age of 60 and over. There are two types of the elderly population, namely potential elderly and non-potential elderly. Potential elderly is elderly who still can meet their own needs and are not dependent on others. Meanwhile, the elderly with no potential is those who are no longer able to fulfill their own needs and depend on others [10].

Several efforts within the government to improve the social welfare of the elderly (PP No. 43 of 2004 in the BPKP, 2004): (a) Improve religious and mental-spiritual services; (b) Improve health services; (c) Improve job opportunity services; (d) Improve education and training services; (e) Provide convenience in the use of public facilities and infrastructure; (f) Providing convenience in legal services; (g) Social protection and assistance.

2.3. Poverty

Poverty has various definitions. According to the Central Statistics Agency, a person can be said to be poor if the level of expenditure is lower than the poverty line. The poverty line used is based on the minimum needs a person needs, namely 2100 calories

per capita plus the minimum non-food needs which are basic needs such as clothing, shelter, school, transportation, etc. Meanwhile, according to Friedman, the definition of poverty is the inequality of opportunity in accumulating the basis of social power [11].

There are two types of poverty. *First,* absolute poverty in which a person's income is not sufficient to meet basic needs such as clothing, shelter, food, health, and education. *Second,* relative poverty where poverty is related to the distribution of income between social strata. Causes of poverty [12] : (a) On a micro level, poverty can occur because of the inequality of resource ownership patterns, resulting in unequal income distribution; (b) There is a difference in the quality of human resources so that productivity is also low; (c) There are differences in access/ownership of capital.

There are several solution models used in reducing poverty [13]: (a) Mobilization of labor that has not been utilized in smallholder households so that it becomes the formation of capital in rural areas; (b) Focuses on establishing resource transfers from agriculture to industry through market mechanisms; (c) Taking into account the potential for rapid growth in the agricultural sector opened up by technological advances.

3. RESEARCH METHODOLOGY

3.1. Types and Sources of Data

This study uses secondary data, namely, data obtained and collected by other parties. The data source of this research comes from the Elderly Population Statistics Report and Welfare Reports obtained from the Central Statistics Agency (BPS) in the 2015-2019 time series.

Collection techniques in this study used document studies where after the researcher collected data and processed it, the data were analyzed by collecting various previous research studies.

| Collection of previous studies | Data from BPS reports and web | Data processing in Stata 14 | Analysis and Interpretation |

Figure 3: Data Collection Techniques.

3.2. Data Analysis Method

The method of analysis used in this research is descriptive statistics with a qualitative approach. This study uses the panel data analysis method with data processing using

the program *Stata 14*. In this study, the dependent variable is poverty with the variable (Y) and the independent variable is Education (X1), Health (X2), TPAK (X3)

Analysis in this study discusses the relationship of more than two variables. The equation function is:

Y = f (X1, X2, X3) ....(1) With the following equation model: Y = ⊠0 + ⊠1. ⊠1it + ⊠2. ⊠2 it + ⊠3. ⊠3 it + e ....(2) Where: ⊠0 = constant ⊠1 = education coefficient ⊠2 = health coefficient ⊠3 = coefficient of TPAK E = error (confounding variable)

3.3. Research Variables

3.3.1. Dependent Variable

Poverty. A person is said to be poor if the level of expenditure is lower than the poverty line. The poverty line used is based on the minimum needs a person needs, namely 2100 calories per capita plus the minimum non-food needs which are basic needs such as clothing, shelter, school, transportation, etc. Meanwhile, according to Friedman, the definition of poverty is the inequality of opportunity in accumulating the basis of social power.

3.3.2. Independent Variable

3.3.2.1 Education

There are several indicators used to measure this level of education [14]:

1. Average Length School is defined as the number of years used by the population undergoing formal education. It is assumed that under normal conditions the average length of schooling for an area will not decrease. The population coverage calculated in calculating the average length of schooling is the population aged 25 years and over.

$$I_{HLS} = \frac{HLS - HLS_{min}}{HLS_{max} - HLS_{min}}$$

1. Old School expectancy is defined duration of the school (in years) that are expected to be felt by children at a certain age in the future. The Old School Expectation Rate is calculated for residents aged 7 years and over. HLS can be used to determine the conditions of education system development at various

levels, which is shown in the form of a length of education (in years) that each child is expected to achieve.

$$I_{RLS} = \frac{RLS - RLS_{min}}{RLS_{max} - RLS_{min}}$$

2. Education Index

$$I_{EDUCATION} = \frac{I_{HLS} - I_{RLS}}{2}$$

Health

Morbidity can be used to measure the level of public health of the elderly in general were seen from the complaints that indicate affected by a particular disease.

Formula: $\frac{JPKK}{Total\ Population}$ x 100%

From the above formula, JPKK represents the number of people who experience health complaints thus disrupting activity [14].

3.3.2.3 Labor Force Participation Rate (TPAK)

The labor force participation rate is a measure used to describe the ratio of the number of workers to the working-age population.

Formula: $\frac{Number\ of\ Work\ Force}{Total\ Population\ of\ Working\ Age}$ x 100%

From the formula above, what is meant by the working-age population is the population aged 15 years and over [14].

3.4. Panel Regression Model Estimation Method [**15**]

3.4.1. Common Effects Model

The common effects model is the simplest panel data approach model because this model does not pay attention to individual dimensions and time, so it is assumed to be the same. In this model, there is a combination of time series data and cross-section in the form of a pool and it is estimated using OLS.

3.4.2. Fixed Effects Model

Model fixed effects is a model that explains that there are different effects between individuals. This difference can be seen in the difference in the intercept. So that the

KnE Medicine

3.4.3. Random Effects Model

The random-effects model (REM) or also known as the error. Component model (ECM) where this model treats the specific effects of each individual as part of component error a random and is uncorrelated with the explanatory variable.

4. RESULTS AND DISCUSSION

$$JPM_{it} = \beta_0 + \beta_1 PEN_{it} + \beta_2 KES_{it} + \beta_3 TPAK_{it} + \varepsilon_{it}$$

Where:

JPM_{it} : Number of Poor People

PEN_{it} : Education

KES_{it} : Health

$TPAK_{it}$: Labor Force Participation Rate

ε_{it} : *Error term*

β_0 : Constants

$\beta_1 ... \beta_3$: Independent variable regression coefficient

i : Subscript place

t : Time subscript

TABLE 1: Estimation Results of the FEM Model.

JPM_{it} = 3050,414 − 1789,068 PEN_{it} - 6,429671 KES_{it} - 13,98529 $TPAK_{it}$ + ε_t (0,002) * (0,058)*** (0,005)
R^2 = 0,1471; F-Stat, = 664,83; Prob, F-Stat, = 0,0000

Source: BPS, compiled. Note: *Significant at α = 0,01; **Significant at α = 0,05; ***Significant at α = 0,10 The numbers in parentheses are the empirical probability (p value) t-statistic.

4.1. Chow Test

The first model selection test is the chow test. H0 Chow test is better than FEM CEM, and HA is FEM is better than CEM. H0 is accepted if the p-value (p-value), probability, or statistical empirical significance of F > α; H0 is rejected if the p-value (p-value), probability, or statistical empirical significance of F £ α.

From the results of the chow test, it can be seen that the p-value, probability, statistical empirical significance F is 0.0000, which means <0.10; so H0 is rejected, FEM is better than CEM.

4.2. Hausman Test

The first model selection test is the Hausman test. H0 Hausman test is REM better than FEM, and HA is FEM better than REM. H0 is accepted if the p-value (p-value), probability, or statistical significance of Chi squares $> \alpha$; H0 is rejected if the p-value (p-value), probability, or statistical significance of Chi squares £ α.

From the results of the Hausman test, it can be seen that the p-value, probability, or statistical empirical significance of Chi squares is 0.0000, which means <0.10; so H0 is rejected, FEM is better than REM.

4.3. Model Existence

A model exists when all independent variables simultaneously have an influence on the dependent variable (the regression coefficient is not simultaneously zero). The model existence test is test F. In this study, the formulation of the model existence test hypothesis is that the regression coefficient is simultaneously zero, or the model does not exist; the regression coefficient is not simultaneously zero or the model exists. H0 will be accepted if the p-value (p-value), probability, or statistical empirical significance of F $> \alpha$.; H0 will be rejected if the p-value (p-value), probability, or statistical empirical significance of F £ α.

From **Table 1**, it can be seen that the p-value, probability, or statistical empirical significance of F the estimation model has a value of 0.0000, which means <0.10; so H0 is rejected, the conclusion of the model used in the research exists.

4.4. Interpretation of Coefficient Determination (R^2)

The coefficient of determination (R^2) shows the power of prediction of the model t estimation. Seen from Table 4.1value R2 of 0.1471, which means that 14.71% of the variation variable number of Poor (JPM) can be explained by the Education (PEN), Health (KES), and Labor Force Participation Rate (LFPR). The remaining 85.29% is influenced by variables or other factors that are not included in the model.

4.5. Effect Validity Test

The results of the effect validity test for all independent variables are summarized in **Table 2.**

Table 2: Validity Test Results of the Effect of Independent Variables.

Variable	sig. t	Criteria	Conclusion
PEN	0,002	< 0,01	Significant at α = 0,01
KES	0,058	< 0,10	Significant at α = 0,10
TPAK	0,005	< 0,10	Significant at α = 0,01

5. Discussion

From the effect validity test in advance, it can be seen that the independent variables that have a significant effect are education, health, and labor force participation levels. The Education Index variable (PEN) has a regression coefficient of -1789.068. The pattern of the relationship between the education index independent variable and the number of poor people is linear so that if education increases by 1 point, the number of poor people will decrease by 1789,068 thousand people. Conversely, if the Education index decreases by 1 point, the number of poor people will increase by 1789,068 thousand people.

The Health Index variable (KES) has a regression coefficient of -6.429671. The pattern of relationship between the independent variable Health and the Number of Poor People is linear, so that if Health increases by 1 percent, the number of poor people will decrease by 6.429671 thousand people. Conversely, if Health decreases by 1 percent, the number of poor people will increase by 6.429671 thousand people.

The variable labor force participation rate index (TPAK) has a regression coefficient of -13.98529. The pattern of the relationship between the independent variable Labor Force Participation Rate and the Number of Poor People is linear, so that if the Labor Force Participation Rate increases by 1 percent, the number of poor people will decrease by 13.98529 thousand people. Conversely, if the Labor Force Participation Rate decreases by 1 percent, the number of poor people will increase by 13.985 thousand people.

6. CONCLUSION

The variables of Education, Health, and Labor Force Participation Level both simultaneously and significantly affect the number of poor people. This shows that the variables of education, health, and the level of work participation which are the benchmarks of welfare explain the increase or decrease in the number of poverty in the elderly population. Thus, if the independent variable decreases, the number of poor people will increase. In the future, the government can continue to pursue programs that support

education, health, and work participation rates to reduce poverty and better equitable welfare.

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